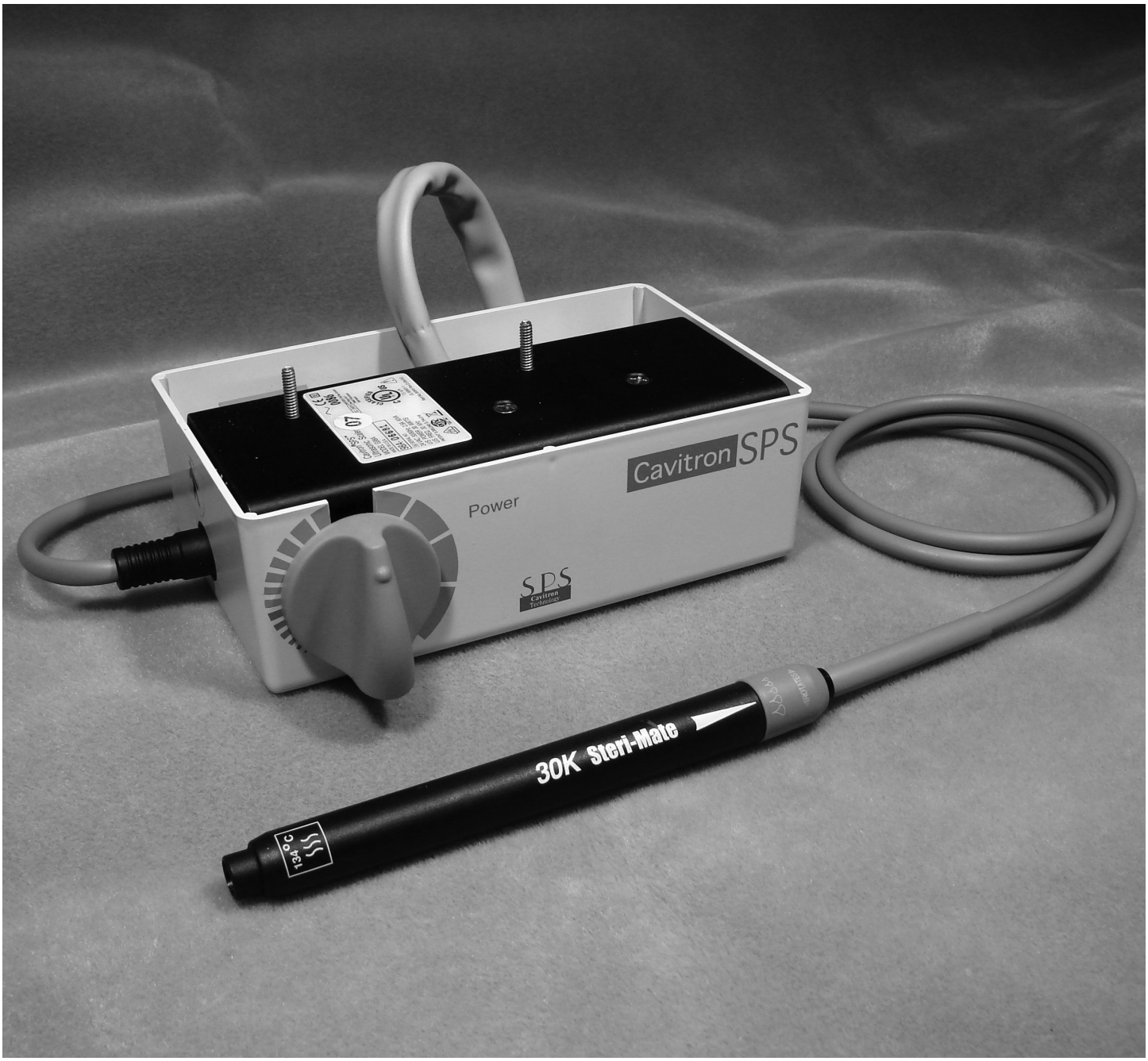
Cavitron® SPS™
Ultrasonic Scaler G98A
Installation and Service Manual



Please read carefully and completely before operating unit.

DENTSPLY PROFESSIONAL

FORWARD

DENTSPLY® Professional is an ISO13485 registered company.

The DENTSPLY® Cavitron® SPS™ Scaler System is classified by Underwriters Laboratories Inc. with respect to electric shock, fire, and mechanical hazards in accordance with UL 60601-1 and CSA C22.2 no. 601.1.

The Cavitron SPS Ultrasonic Scaler is equipped with a Sustained Performance System™ (SPS), which offers a constant balance between scaling efficiency and patient comfort by maintaining the unit's power level when the insert tip encounters tenacious deposits allowing the clinician to effectively scale even at a decreased/lower power setting.

The System operates by converting an SELV source current into high frequency current. The ultrasonic system consists of two parts: the handpiece/insert combination and the SPS™ electronic system. The SPS™ system incorporates two closed loops. One loop provides automatic tuning (operating frequency is adjusted to be at resonance for each insert), the second loop automatically controls the tip stroke over different working conditions. The DENTSPLY® Cavitron® SPS™ scaler produces 30,000 microscopically small strokes per second at the insert's working tip. This, combined with acoustic effects of the coolant water, produces a synergistic action that literally "powers away" the heaviest calculus deposits while providing exceptional operator and patient comfort.

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SPECIFICATIONS

Electrical Input	Voltage	24 VAC SELV source
	Current	2.5 Amps
	Frequency	50/60 Hz
	Power	60 VA
Pneumatic	Water Pressure	25 – 60 psi (172 – 414 kPa)
	Water Temperature	41ºF – 77ºF (5ºC – 25ºC)
	Air Pressure (yellow line)	0 – 125 psi (0 – 862 kPa)
	Air Pressure (orange line)	0 – 125 psi (0 – 862 kPa)
Output	Frequency	30 kHz nominal
	Power	3 – 30 watts
	Water flow rate	10 < flow < 60 ml/min
Dimensions	Height	2.0 inches (5.1 cm)
	Width	3.7 inches (9.4 cm)
	Length	6.0 inches (15.3 cm)
	Weight - Module	24.0 ounces (694 g)
	- Module w/cable +Steri-Mate	27.4 ounces (792 g)

OPERATING CONDITIONS

Ambient temperature: 15 – 40°C
Humidity: 30 – 75% RH

STORAGE AND SHIPPING CONDITIONS

Ambient temperature: -40°C – 70°C
Humidity: 10 – 95 RH (non-condensing)
Atmospheric pressure range: 7 – 15 psi (50 – 106 kPa)

CLASSIFICATIONS

Input Voltage	Supplied by SELV power source
Degree of protection against electric shock	Type B
Degree of protection against harmful ingress of water	Ordinary
Mode of operation	Continuous
Medical Device Directive Classification	IIa

Equipment is not suitable for use in the presence of flammable mixtures

Type B Equipment

Footswitch IPX1

OR

Read Users Manual

AC power (AC 24~)

Recognized by Underwriters Laboratories Inc. with respect to electric shock, fire, EMC and mechanical hazards only in accordance with UL 60601-1 and CSA C22.2 no. 601.1

INTENDED USE

This product is intended for installation into an existing dental handpiece delivery system. The end users are dental professionals. The devices are used to debride light to heavy calculus deposits from the tooth and root surfaces. Other applications specialties include Periodontics, Orthodontics, and Endodontics.

TECHNICAL SUPPORT

For technical support and repair assistance in the U.S., call a Cavitron Care℠ representative at 1-800-989-8826 or 717-767-8502 Monday through Friday, 8:00 AM to 5:00 PM (Eastern Time). For other areas, contact your local DENTSPLY representative.

SUPPLIES & REPLACEMENT PARTS

To order supplies or replacement parts in the U.S., contact your local DENTSPLY Professional Distributor or call 1-800-989-8826 or 717-767-8502, Monday through Friday, 8:00 A.M. to 5:00 P.M. (Eastern Time). For other areas, contact your local DENTSPLY Professional Representative.

DISPOSAL OF UNIT

Disposal of unit shall be in accordance with local regulations.

Rx Only

WARRANTY

The Cavitron® SPS™ G98 Ultrasonic Scaler is warranted for TWO YEARS from date of purchase. The Steri-Mate Handpiece enclosed with your system is warranted for SIX MONTHS from date of purchase. Refer to the Warranty Statement Sheet furnished with your system for full warranty Statement and Terms.

SECTION 1: Indications For Use

1.1 Ultrasonic Procedures

- All general supra- and subgingival scaling applications.
- Periodontal debridement for all types of periodontal diseases.
- Endodontic procedures.

SECTION 2: Contraindications & Warnings

2.1 Contraindications

- Ultrasonic Systems should not be used for restorative procedures involving condensation of amalgam.
- For optimum performance use only with inserts manufactured by DENTSPLY Professional.

2.2 Warnings

- Persons fitted with cardiac pacemakers, defibrillators and other active implanted medical devices, have been cautioned that some types of electronic equipment might interfere with the operation of the device. Although no instance of interference has ever been reported to DENTSPLY, we recommend that the handpiece and cables be kept at least 6 to 9 inches (15 to 23 cm) away from any device and their leads during use.
- There are a variety of pacemakers and other medically implanted devices on the market. Clinicians should contact the device manufacturer or the patient's physician for detailed information about the device.
- Dental Healthcare Professionals are responsible for reading the Directions for Use, understanding the capabilities of the Cavitron ultrasonic scaler and making appropriate choices for use of this instrument consistent with their knowledge, training, and experience.
- Directions for use are not intended to advise Dental Healthcare Professionals on the practice of dentistry.
- This product is designed to assist in eliminating susceptibility to retraction of oral fluids. To ensure adequate protection from cross-contamination from other devices connected to the Dental Unit, it is highly recommended that the Dental Unit be installed with anti-retraction features. Additionally, the Dental Unit, including the anti-retraction features, must be properly maintained and periodically tested. For more information, please contact your Dental Unit manufacturer.
- Failure to follow the recommendations for environmental operating conditions, including input water temperature, could result in injury to patients or users.
- The use of High Volume Saliva Evacuation to reduce the quantity of aerosols released during treatment is highly recommended.
- It is the responsibity of the Dental Healthcare Professional to determine the appropriate uses of this product and to understand the health of each patient, the dental procedures being undertaken, and industry and governmental agency recommendations, requirements, and regulations for safe practice of dentistry.

- Where asepsis is required or deemed appropriate in the best professional judgement of the Dental Healthcare Professional, this product should not be used.
- During boil-water advisories, this product should not be operated as an open water system (e.g. connected to a public water system). A Dental Healthcare Professional should disconnect the system from the central water source. The Cavitron DualSelect™ system can be attached to this unit and operated as a closed system until the advisory is cancelled. When the advisory is cancelled, flush all incoming waterlines from the public water system (e.g. faucets, waterlines and dental equipment) in accordance with the manufacturer's instructions for a minimum of 5 minutes.
- Prior to beginning treatment, patients should rinse with an antimicrobial such as Chlorhexidine Gluconate 0.12%. Rinsing with an antimicrobial reduces the chance of infection and reduces the number of microorganisms released in the form of aerosols during treatment.

SECTION 3: Precautions

3.1 System Precautions

- Equipment flushing and dental water supply system maintenance are strongly recommended.
- Close manual shut-off valve on the dental office water supply every night before leaving the office.
- The use of an in-line water filter is recommended.
- Never operate system without fluid flowing through handpiece.

3.2 Precautions for Ultrasonic Prophylaxis Procedures

- Like a toothbrush, ultrasonic inserts "wear out" with use. Inserts with just 2 mm of wear lose about 50% of their scaling efficiency. In general, it is recommended that ultrasonic inserts be discarded and replaced after 90 days, under normal use, to maintain optimal efficiency and avoid breakage. A Cavitron® Insert Efficiency Indicator is enclosed for your use.
- Discard the insert immediately if excessive wear is noted, or the insert shows signs of damage through mishandling.
- Ultrasonic insert tips that have been bent, damaged, or reshaped are susceptible to in-use breakage and should be discarded and replaced immediately.
- Retract the lips, cheeks, and tongue to prevent contact with the insert tip whenever it is placed in the patient's mouth.
- Water should be used for all scaling procedures. Water flow is adjustable from less than 10 to greater than 60 ml per minute.
- The Cavitron unit works with Cavitron inserts as a system, and was designed and tested to deliver maximum performance for all currently available Cavitron and Cavitron Bellissima™ brand ultrasonic inserts. Companies that manufacture, repair or modify inserts carry the sole responsibility for proving the efficacy and performance of their products when used as a part of this system. Users are cautioned to understand the operating limits of their inserts before using in a clinical setting.
- Only adjust the system's power adjustment knob with the insert outside the patients mouth.

SECTION 4: Infection Control

4.1 Infection Control Information Reference Booklet

- For your convenience, an Infection Control Information Reference Booklet has been included with your Cavitron® SPS™ System. Additional booklets can be obtained by calling Customer Service at 1-800-989-8826 or 717-767-8502 Monday through Friday, 8:00 AM to 5:00 PM (Eastern Time). For other areas, contact your local DENTSPLY representative. Insert sterilization information is included in each insert package.

4.2 General Infection Control Information

- Use standard personal protection equipment (i.e., wear face mask, eyewear, or face shield, gloves and protective gown).
- For maximum operator and patient safety, carefully follow the Infection Control Information procedures detailed on the reference cards accompanying your System.
- The combination of water and ultrasonic vibration will create aerosols. With proper technique, much of the aerosols can be effectively controlled and minimized. Please carefully follow the procedural guidelines regarding the use of your System.

4.3 Water Supply Recommendations

- It is highly recommended that all dental water supply systems conform to applicable CDC (Centers for Disease Control and Prevention) and ADA (American Dental Association) standards, and that all recommendations be followed in terms of flushing, and general infection control procedures. Knowledge

of and compliance with agency guidelines, standards and recommendations is the sole responsibility of the Dental Healthcare Professional.

- As a medical device, Cavitron® products need to be installed in accordance with local or national regulations, including guidelines for water quality (e.g. drinking water). As an open water system, such regulation may require your Cavitron product to be connected to a centralized water control device that prevents water containing contaminates from back-flow into the water supply.

SECTION 5:
Water Line Requirements

- Incoming water supply line pressure to the ultrasonic scaler must be 25 psi (172kPa) minimum to 60 psi (414 kPa) maximum. If your dental water system's supply line pressure is above 60 psi, install a water pressure regulator on the water supply line to your Ultrasonic Scaler.
- A manual shut-off valve on the dental water system supply line should be used so that the water can be completely shut-off when the office is unoccupied.
- A filter in the dental water system supply line is recommended so that the particles in the water supply will be trapped before reaching the ultrasonic scaler.
- After the above installations are complete on the dental water supply system, the dental office water line should be thoroughly flushed prior to connection to the ultrasonic system.
- After flushing system verify there are no leaks.

SECTION 6:
Installation Instructions

6.1 Installation / Removal / Service Instructions

The Cavitron® SPS™ Integrated Scaler must be installed by a trained technician. The Installation Diagram shows all connections to the Dental Control Unit. The power source must be a double insulated SELV-type device and qualified to IEC 601.1. ALL POWER, WATER AND AIR INPUTS TO THE DENTAL CONTROL UNIT MUST BE OFF DURING THE INSTALLATION AND REMOVAL OF THE CAVITRON SYSTEM.

Installation: Purge the main water and air lines to the Dentral Control Unit before connecting the Cavitron module.

1. Remove the Cavitron Ultrasonic Scaler, the handpiece cable assembly, Steri-Mate® handpiece, and mounting kit P/N 80918 from the shipping carton and set aside for mounting.
2. Remove the cover of the Dental Control Unit.
3. Remove the mounting template from this manual and cut out as described (there are two templates).
4. Place the template on the bottom of the Dental Control Unit and position to mark the mounting holes.
5. Check to be sure the Cavitron module will be properly placed and that the power control is easily accessible.
6. Carefully mark and drill the mounting holes.
7. Invert the module, route the cable through the large diameter hole, align the two mounting studs and secure the module.
8. Locate the pilot air inside the Dental Control Unit, cut the tube and insert the tee fitting on the yellow adapter assembly in the mounting kit.
9. Secure all fittings with the supplied tubing retainers.
10. Secure the other end of the adapter assembly to the yellow tubing from the Cavitron module cable.
11. Secure the air line from the handpiece holder valve to the remaining barb on the adapter assembly.
12. Locate the input water line in the Dental Control Unit. Cut the line and insert and secure a small tee fitting.
13. Connect and secure the red tubing from the module cable to the remaining barb on the small tee fitting.
14. Locate the input drive air line in the Dental Control Unit. Cut line, insert and secure the large tee fitting.
15. Connect and secure the orange tubing from the Cavitron module cable to the remaining barb on the large tee fitting.
16. Connect the two (2) electrical wires from the module cable to the 24 VAC terminals in the Dental Control Unit.
17. The system is ready for post installation system check.

6.2 Post Installation Check

Turn on all water and air inputs to the Dental Control Unit. Verify that all connections made during installation do not leak and are secured with the supplied tubing retainers.

Preliminary Set-up

- Turn on the Dental Control Unit (refer to instruction manual).
- Set the power adjustment to the top of the Blue Zone.
- Plug the handpiece into the receptacle on the rear of the Cavitron module.

- Connect Steri-Mate® handpiece to the cable connector assembly.
- Adjust the blue lavage control at the back of the handpiece to maximum (fully clockwise).

Performance Check: Power and Lavage Flow

- Activate foot control and purge the water system for 2 minutes.
- Hold the handpiece (without an insert installed) in an upright position over a sink or drain.
- Activate footswitch to fill the handpiece with water.
- Lubricate the rubber o-ring on the insert with water before placing it into the handpiece. Fully seat insert with a gentle push-twist motion. DO NOT FORCE.
- Adjust the lavage control at the end of the handpiece for a moderate flow.
- Verify operation by adjusting the power control between minimum and maximum on the Cavitron module and observe a change in the water spray.

Performance Check: Power Boost *(available only with variable pressure foot controls)*

- Adjust power control on the Cavitron module to the top of the Blue Zone.
- Fully depress foot control and observe sound and spray.
- Reduce pressure on the foot control until a change in spray and sound is noticeable.
- Vary pressure on the foot control to toggle between standard and boost modes.

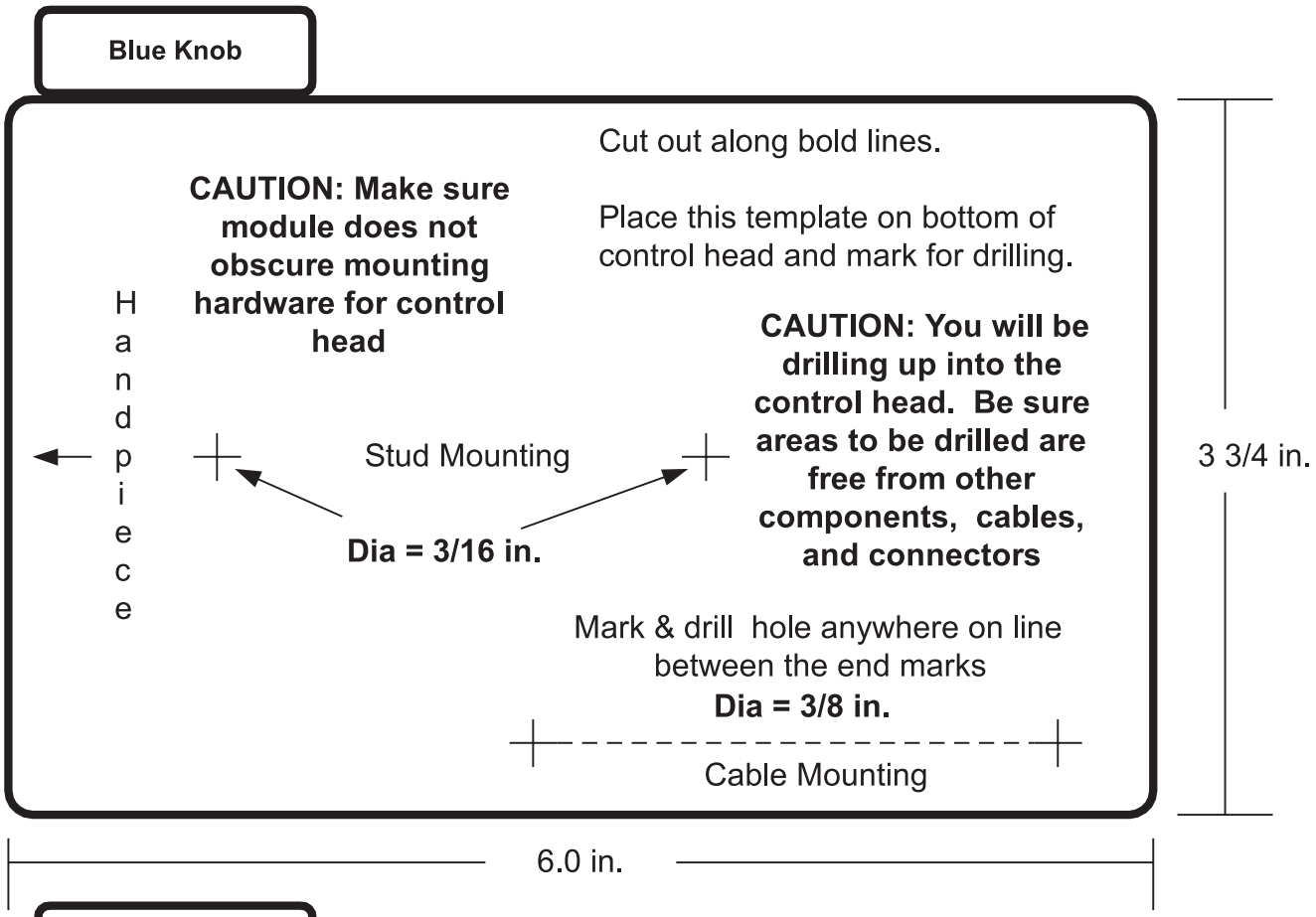
Installation Check: Interface Test

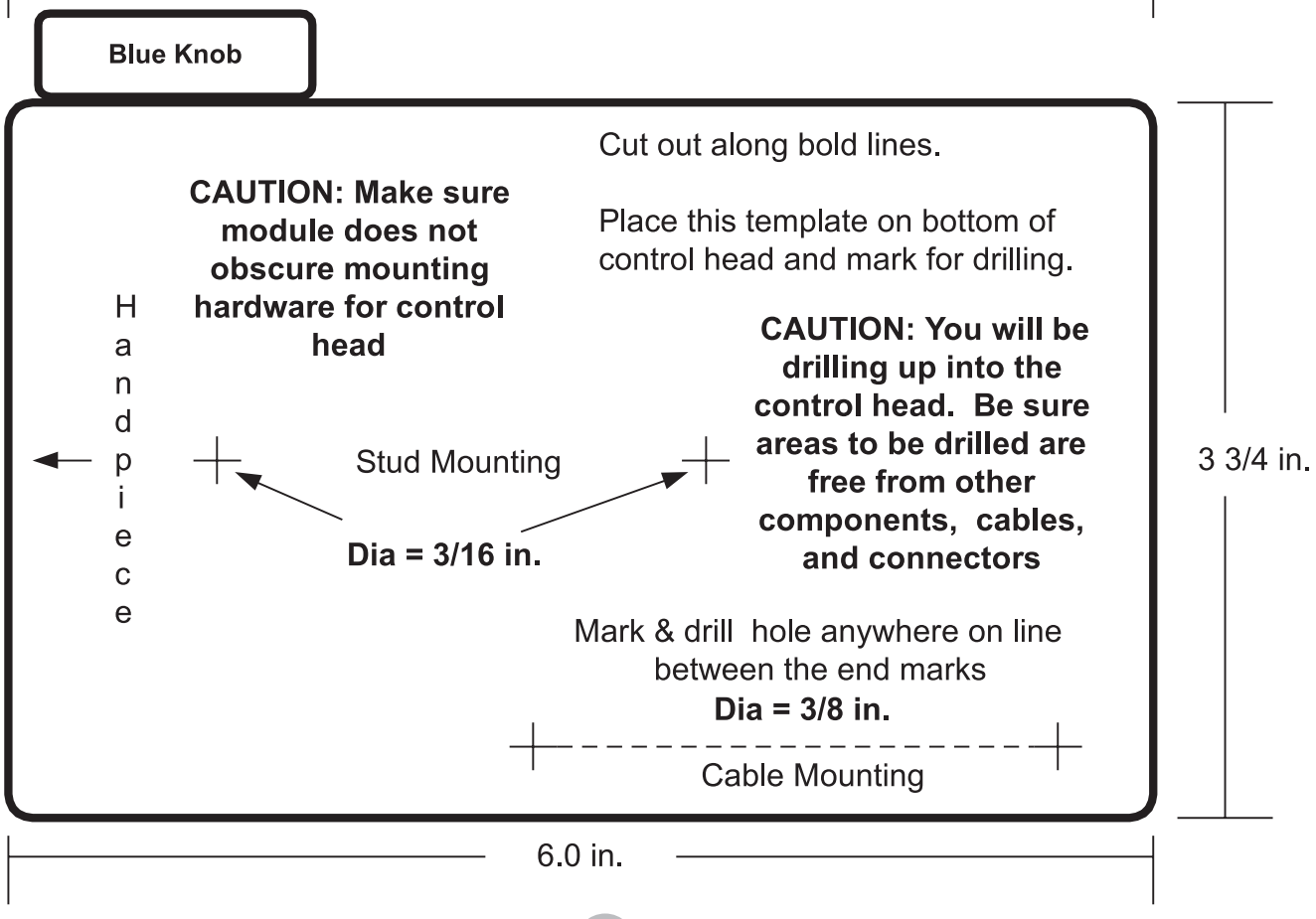
- Place handpiece in holder and depress foot control.
- Verify Cavitron module does not activate.
- Inspect the inside of the Dental Control Unit and verify that all connections do not leak.

The Cavitron module has been successfully installed. Replace the cover to the Dental Control Unit.

6.3 Installation Notes

6.4 Installation Templates


Blue Knob
Cut out along bold lines.
CAUTION: Make sure module does not obscure mounting hardware for control head
Place this template on bottom of control head and mark for drilling.
CAUTION: You will be drilling up into the control head. Be sure areas to be drilled are free from other components, cables, and connectors
Handpiece
Stud Mounting
Dia = 3/16 in.
Mark & drill hole anywhere on line between the end marks
Dia = 3/8 in.
Cable Mounting
3 3/4 in.
6.0 in.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Cut out along bold lines.
CAUTION: Make sure module does not obscure mounting hardware for control head
Place this template on bottom of control head and mark for drilling.
CAUTION: You will be drilling up into the control head. Be sure areas to be drilled are free from other components, cables, and connectors
Handpiece
Stud Mounting
Dia = 3/16 in.
Mark & drill hole anywhere on line between the end marks
Dia = 3/8 in.
Cable Mounting
3 3/4 in.
6.0 in.

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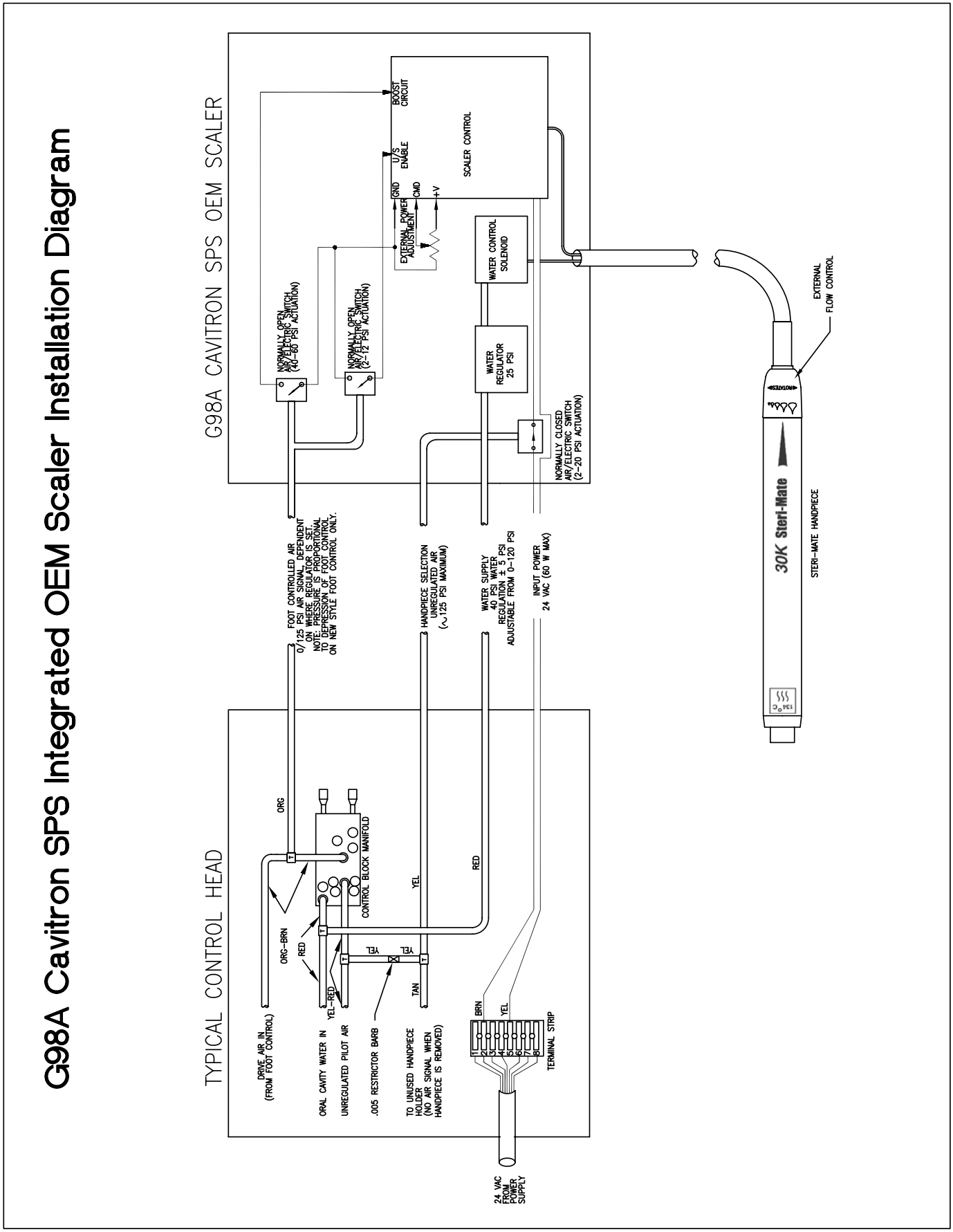
G98A Cavitron SPS Integrated OEM Scaler Installation Diagram


G98A CAVITRON SPS OEM SCALER
SCALER CONTROL
BOOST CIRCUIT
U/S ENABLE
GND
CMD
+V
EXTERNAL POWER ADJUSTMENT
NORMALLY OPEN AIR/ELECTRIC SWITCH (40-60 PSI ACTUATION)
NORMALLY OPEN AIR/ELECTRIC SWITCH (2-12 PSI ACTUATION)
WATER CONTROL SOLENOID
WATER REGULATOR 25 PSI
NORMALLY CLOSED AIR/ELECTRIC SWITCH (2-20 PSI ACTUATION)
FOOT CONTROLLED AIR 0/125 PSI AIR SIGNAL DEPENDENT ON WHERE REGULATOR IS SET. NOTE: PRESSURE IS PROPORTIONAL TO DEPRESSION OF FOOT CONTROL ON NEW STYLE FOOT CONTROL ONLY.
HANDPIECE SELECTION UNREGULATED AIR (~125 PSI MAXIMUM)
WATER SUPPLY 40 PSI WATER REGULATION 1-5 PSI ADJUSTABLE FROM 0-120 PSI
INPUT POWER 24 VAC (60 W MAX)
EXTERNAL FLOW CONTROL
30K Steri-Mate
STERI-MATE HANDPIECE
TYPICAL CONTROL HEAD
ORG
ORG-BRN
RED
YEL-RED
YEL
YEL
TAN
RED
YEL
BRN
CONTROL BLOCK MANIFOLD
DRIVE AIR IN (FROM FOOT CONTROL)
ORAL CAVITY WATER IN
UNREGULATED PILOT AIR
.005 RESTRICTOR BARB
TO UNUSED HANDPIECE HOLDER (NO AIR SIGNAL WHEN HANDPIECE IS REMOVED)
TERMINAL STRIP
1 2 3 4 5 6 7 8
24 VAC FROM POWER SUPPLY

6.6 Installation and Operation Tables

Cavitron SPS G-98A Connection	Dental Control Unit Head
BROWN & YELLOW WIRES 24 Volts **AC Power**	Connect to terminal strip. 24 Volt AC, 300 Watt Power Supply
RED TUBE Scaler **Water Supply**	Tee into RED Control Block Manifold water tube 25–60 psi Water Supply
YELLOW TUBE Handpiece Selection **Pilot Air**	Use installation tubing kit to Tee into YELLOW-RED tube on Control Block Manifold – Pilot Air. .005 Restrictor Barb installed in series. Unused handpiece holder or handpiece whip position required.
ORANGE TUBE Foot Control **Drive Air**	Tee into ORANGE-BROWN tube on Control Block Manifold – Drive Air.

SCALER 24 VAC POWER ACTIVATION – *Yellow Tube*		
1. Cavitron Steri-Mate Scaler Handpiece **IN** Holder. 2. Cavitron Steri-Mate Scaler Handpiece whip **RELEASED**.	Scaler 24 VAC Power – **OFF** Air–Electric switch – CIRCUIT OPEN	1. >20 psi air pressure to Yellow tube. HP Holder Whisker valve sealed. 2. >20 psi air pressure to Yellow tube. Handpiece whip bleed valve sealed.
1. Cavitron Steri-Mate Scaler Handpiece selected and **REMOVED** from Holder. 2. Cavitron Steri-Mate Scaler Handpiece whip selected and **PULLED FORWARD**.	Scaler 24 VAC Power – **ON** Air–Electric switch – CIRCUIT CLOSED	1. 2–20 psi air pressure to Yellow tube. HP Holder Whisker valve bleeds air pressure off. 2. 2–20 psi air pressure to Yellow tube. Handpiece whip bleed releases air pressure.

NORMAL & BOOST ULTRASONIC SCALING POWER – *Orange Tube*		
Proportional Foot Control depressed **partially**.	Cavitron SPS™ Ultrasonic scaling power activated in **NORMAL** mode. Dual Air-Electric Switch, S1 CLOSES (S1 = Blue & Black Leads)	2–12 psi air pressure to Orange tube.
Proportional Foot Control depressed to a **lower position or completely**.	Cavitron SPS™ Ultrasonic scaling power will switch from NORMAL mode to **BOOST** mode. Dual Air-Electric Switch, S1 and S2 CLOSE (S1 = Blue & Black Leads, S2 = White & Black Leads)	40 – 80 psi air pressure to Orange tube.

SECTION 7: SPS™ Ultrasonic Scaler System Description

7.1 System Controls

The Cavitron® SPS™ module is enabled whenever the clinician removes the handpiece from the handpiece holder.

ON/OFF Function

The Ultrasonic scaling activation is switched ON and OFF using the treatment unit's footswitch.

Power Adjustment

Turn knob to select ultrasonic power level for operation: clockwise increases system power, counter clockwise decreases system power.

The Blue Zone™ is an extended low-power range providing effective subgingival debridement and greater patient comfort during definitive therapy.

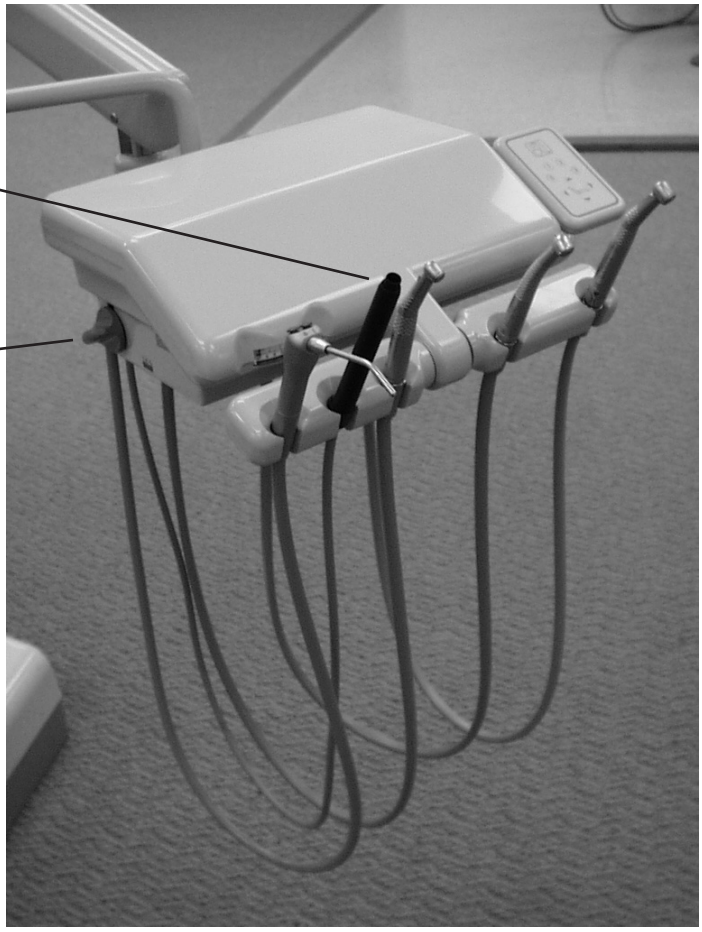
Foot Controlled Power Boost Function

A second position on the footswitch (fully depressed footswitch) provides the capability to briefly increase the unit's power output for quick, efficient removal of tenacious deposits using only the foot control without touching the unit.

Note: Foot controlled power boost function requires a variable pressure/proportional footswitch.

Lavage Flow Adjustment

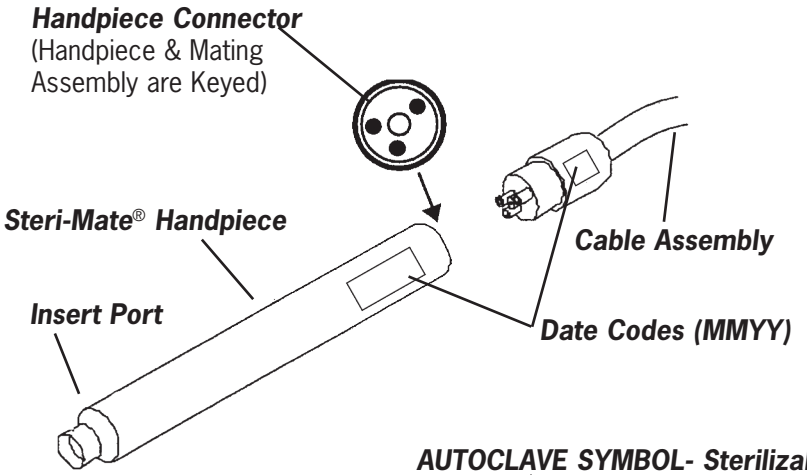
Water flow through the handpiece is adjusted by rotating a control element on the cable connector (blue).



TYPICAL INSTALLATION

7.2 Steri-Mate Handpiece / Cable

The handpiece accepts all Cavitron® 30K™ Ultrasonic Inserts.



Date Codes (MMYY)
Prior to connecting, align Handpiece and Cable Assembly electrical connections. If Cable Assembly does not seat into Handpiece, gently rotate handpiece until contacts align.

DO NOT TWIST WHILE PUSHING CONNECTOR INTO HANDPIECE.

AUTOCLAVE SYMBOL- Sterilizable up to temperature specified

Lavage Control

Turn the Lavage Control to select flow rate during system operation. Clockwise increases flow at insert tip, counterclockwise decreases flow. The flow rate through the handpiece also determines the temperature of the lavage. Lower flow rates produce warmer lavage. Higher flow rates produce cooler lavage.

If the handpiece becomes warm, increase the flow rate. With experience, the Dental Healthcare Professional will be able to determine the best flow rate setting for optimum operating efficiency and patient comfort.

Swivel Feature

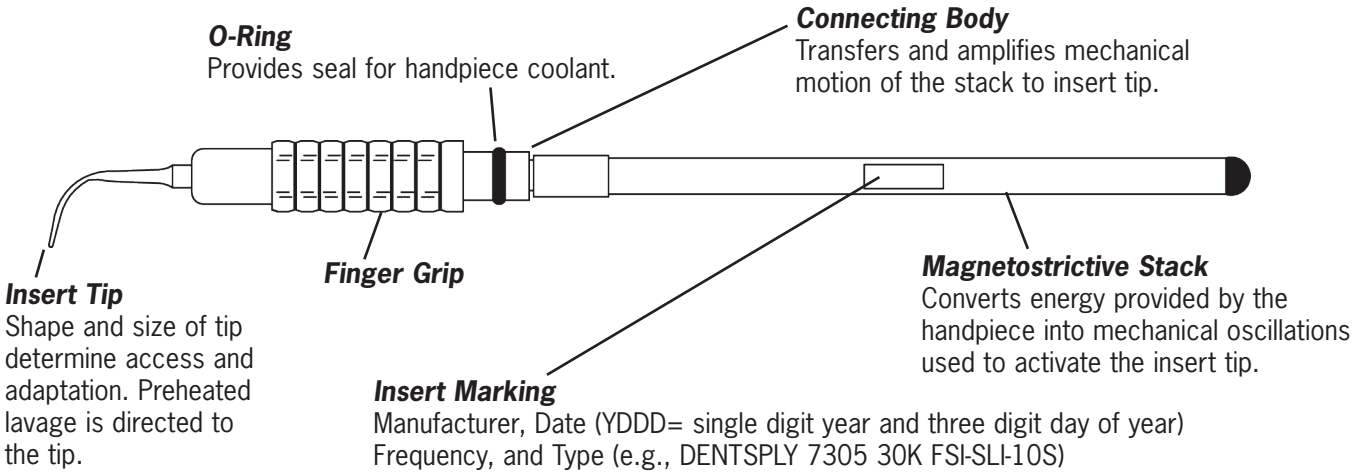
Reduces cable drag as handpiece rotates during procedures.

Steri-Mate Grip Accessory (not shown)

The Steri-Mate Grip provides an ergonomic and comfortable grasp of the handpiece. The grip is sterilizable and is available in several different colors as an accessory for your Steri-Mate Handpiece. See installation instructions provided with the grip.

7.3 Cavitron® 30K™ Ultrasonic Inserts

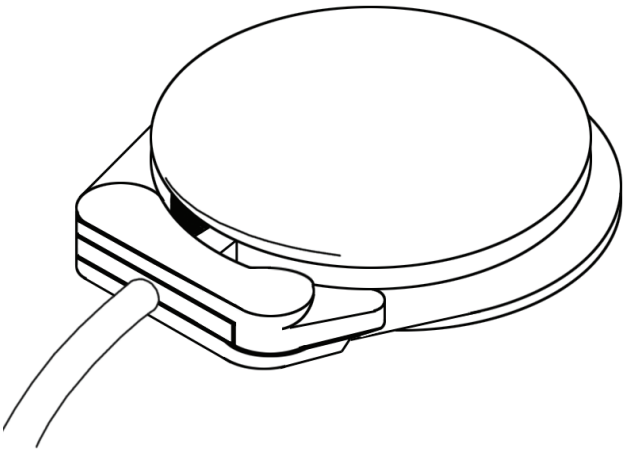
The many styles of DENTSPLY Cavitron® Ultrasonic Inserts are easily interchangeable for various procedures and applications.


O-Ring
Provides seal for handpiece coolant.
Connecting Body
Transfers and amplifies mechanical motion of the stack to insert tip.
Insert Tip
Shape and size of tip determine access and adaptation. Preheated lavage is directed to the tip.
Finger Grip
Magnetostrictive Stack
Converts energy provided by the handpiece into mechanical oscillations used to activate the insert tip.
Insert Marking
Manufacturer, Date (YDDD= single digit year and three digit day of year)
Frequency, and Type (e.g., DENTSPLY 7305 30K FSI-SLI-10S)

Hold the handpiece in an upright position. Depress footswitch to fill the handpiece with water. Lubricate the rubber O-Ring on the insert with water before placing it into the handpiece. Fully seat insert with a gentle push-twist motion. DO NOT FORCE.

7.4 Foot Control Information & Operation

- The Foot Control activates both ultrasonic energy and Lavage Flow at the insert tip. Lightly depressing the footswitch whenever the handpiece is removed from the handpiece holder will activate the ultrasonics and lavage flow.
- A boost function is activated by fully depressing the footswitch. This feature is active in the low to mid range of the power control. The power level will return to the control setting when the footswitch is returned to it's slightly depressed position. The momentary increase in power is indicated by a slight increase in noise level and a change in spray pattern.
- Practicing outside the mouth is recommended for the operator to familarize themselves with the boost feature.



SECTION 8: Accessories

- Steri-Mate® Detachable Sterilizable Handpiece
- Steri-Mate® Handpiece Grips
- Detachable Handpiece Cable Assembly with Swivel
- Cavitron® Ultrasonic Inserts

SECTION 9: Techniques For Use

9.1 Patient Positioning

- The backrest of the chair should be adjusted for optimal access to both the upper and lower arches. This assures patient comfort and clinician visibility.
- Have the patient turn head to the right or left.
- Position chin up or down depending on the quadrant and surface being treated.
- Evacuate irrigant using either a saliva ejector or High Vacuum Evacuator (HVE).

9.2 Performing Ultrasonic Scaling Procedures

Note: Refer to the Infection Control Information booklet supplied with your system for general procedures to be followed at the beginning of each day and between patients.

- The edges of Cavitron® Ultrasonic Inserts are intentionally rounded so there is minimal danger of tissue laceration with proper ultrasonic scaling techniques. Wherever the insert tip is placed in the patient's mouth, the lips, cheek and tongue should be retracted to prevent accidental (prolonged) contact with the activated tip.
- Turn Power Level Control to select ultrasonic power level for operation. Clockwise increases system power. Power level will increase throughout the full range of the control. Hold the handpiece over a sink or drain. Press the foot control to activate the system. Check spray to verify fluid is reaching the working end of the insert tip. Adjust the Lavage Control to ensure adequate flow for the selected power setting. Greater flow settings provide cooler irrigation.
- It may be necessary to adjust lavage with the system in "Boost" mode (Foot Control fully depressed) so adequate fluid will be available to cool tip to tooth interface.
- In general, it is suggested that a "feather-light-touch" be used for ultrasonic scaling. The motion of the activated tip and acoustic effects of the irrigating fluid, in most cases, are adequate to remove even the most tenacious calculus.
- Periodically check the Cavitron Ultrasonic Insert for wear with the Cavitron Insert Efficiency Indicator.
- The use of a saliva ejector or High Volume Evacuator (HVE) is recommended during all procedures.
- Set the system's Power Level Control to the lowest efficient power setting for the application and the selected insert.

9.3 Patient Comfort Considerations

Reasons for sensitivity

- Incorrect tip placement. Point should be directed away from root surfaces.
- Not keeping the tip in motion on the tooth. Do not allow the insert to remain in a static position on any one area of the tooth. Change the insert's path of motion.
- Applying excessive pressure. Use extremely light grasp and pressure, especially on exposed cementum.
- If sensitivity persists, decrease power setting and/or move from the sensitive tooth to another and then return.

SECTION 10: System Care

It is recommended that you perform the following maintenance procedures to help maximize water quality and to be in compliance with CDC guidelines for infection control.

10.1 Daily Protocol

START-UP PROCEDURES AT THE BEGINNING OF THE DAY:

1. Switch ON the dental treatment unit (refer to instruction manual of treatment unit).
2. Remove the Cavitron® cable connector assembly from handpiece holder and set power adjustment to top of Blue Zone.
3. Connect a sterilized Steri-Mate® handpiece to the cable connector assembly. (Refer to the Infection Control information booklet for sterilizing instructions.)
4. Adjust the lavage control to maximum.
5. Hold the handpiece (without an insert installed) over a sink or drain. Activate the foot control and flush water through handpiece for two minutes.
6. Place a sterilized insert into the handpiece using a gentle push-twist motion. (Refer to the Cavitron Ultrasonic Inserts Directions for use for cleaning and sterilizing instructions.)
7. Activate the ultrasonics and adjust the power and lavage control to your preferred operating positions.

BETWEEN PATIENTS:

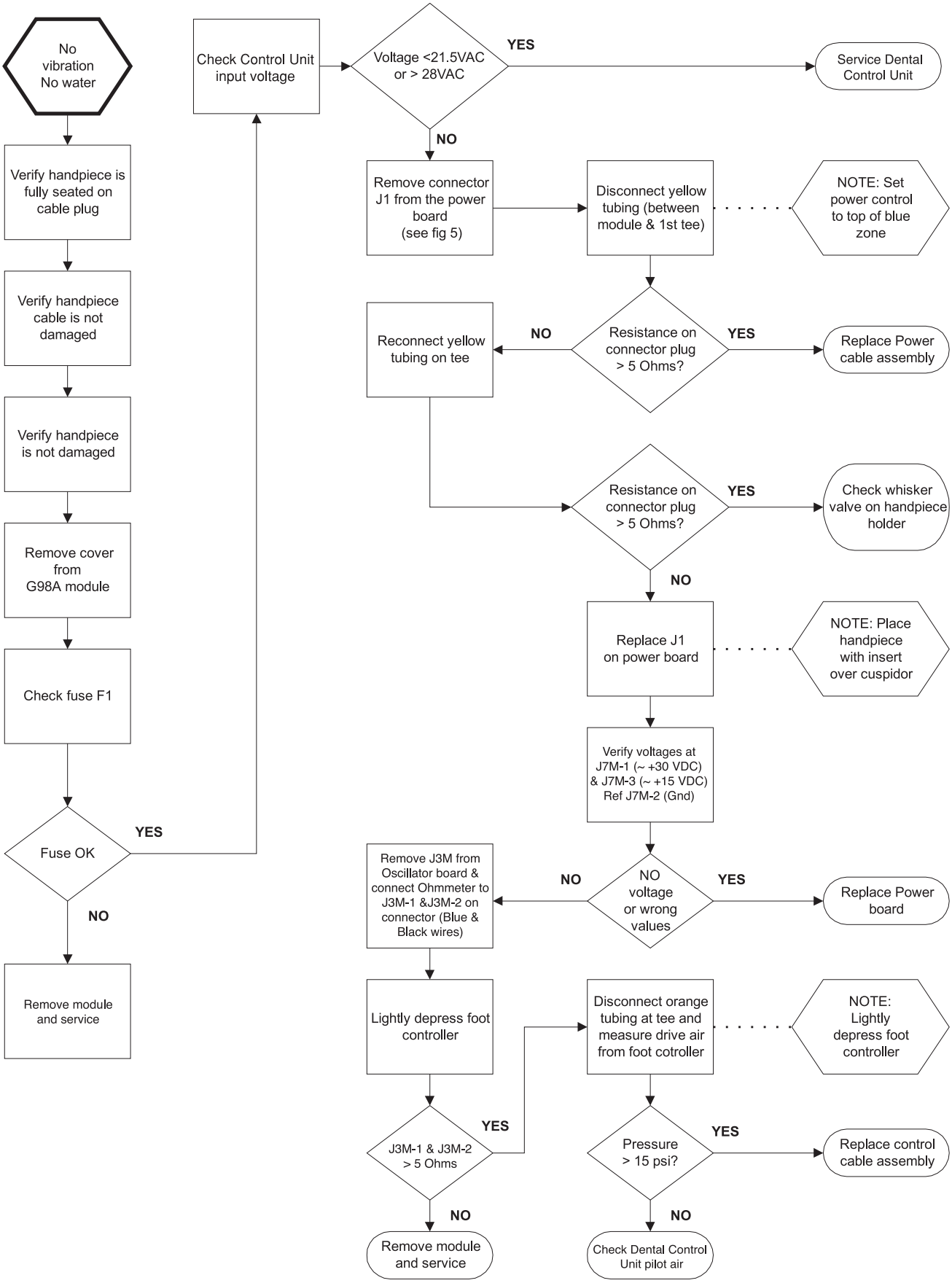
1. Remove any ultrasonic inserts and the Steri-Mate® handpiece. Clean and sterilize the handpiece and all inserts used during the procedure. (Refer to the Infection Control Information booklet and the Cavitron Ultrasonic Inserts Directions for Use for cleaning and sterilizing instructions.)
2. Clean and disinfect the handpiece cable assembly by applying a water-based disinfectant solution*, carefully following the instructions provided by the solution manufacturer. To clean the cable, generously spray disinfectant solution on a clean towel and wipe the cable and connector. Discard used towel. To disinfect the system, generously spray disinfectant on a clean towel and wipe the cable and connector. Allow the disinfectant solution to air dry.
3. Clean and disinfect all surfaces of the dental treatment control head according to the manufacturer's instructions.
4. Connect a sterilized Steri-Mate® handpiece onto its mating cable connector. Set power adjustment to top of the Blue Zone, adjust the lavage control to maximum.
5. Hold the handpiece (without an insert installed) over a sink or drain. Activate the foot control and flush water through handpiece for at least thirty seconds.
6. Place a sterilized insert into the handpiece.

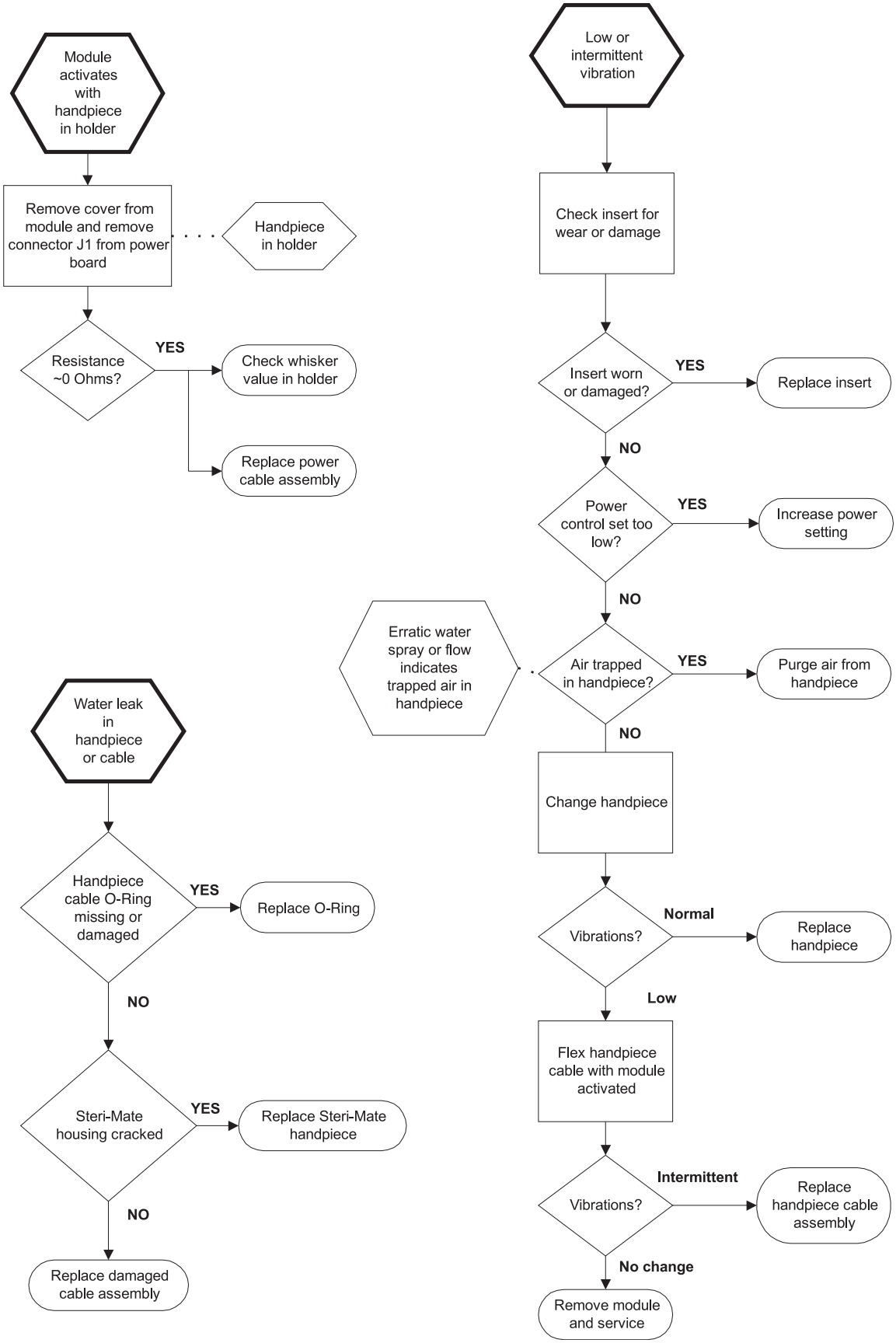
SHUT-DOWN PROCEDURES AT THE END OF THE DAY:

1. Flush the Cavitron® ultrasonic system according to the dental treatment unit manufacturer's instructions.
2. Remove any ultrasonic inserts and the Steri-Mate® handpiece. Clean and sterilize the handpiece and all inserts used during the procedure. (Refer to the Infection Control Information booklet and the Cavitron Ultrasonic Inserts Directions for Use for cleaning and sterilizing instructions.)
3. Clean and disinfect the handpiece cable assembly by applying a water-based disinfectant solution*, carefully following the instructions provided by the solution manufacturer. To clean the cable, generously spray disinfectant solution on a clean towel and wipe the cable and connector. Discard used towel. To disinfect the system, generously spray disinfectant on a clean towel and wipe the cable and connector. Allow the disinfectant solution to air dry.
4. Clean and disinfect all surfaces of the dental treatment control head according to the manufacturer's instructions.
5. Place the cable connector into the handpiece holder for storage.
6. Turn OFF the power and water to the dental treatment unit.

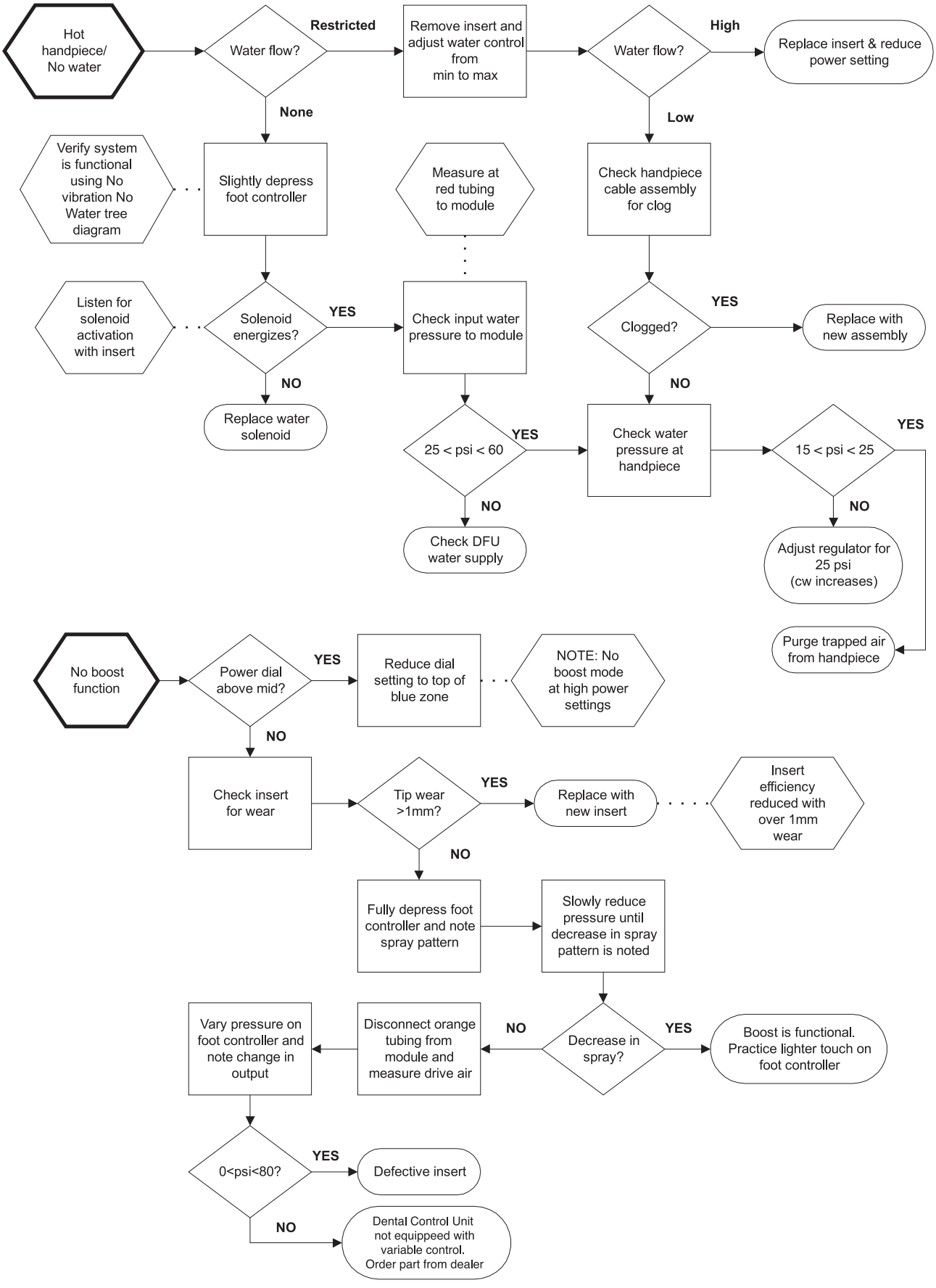
NOTE: Water-based disinfection solutions are preferred. Some alcohol-based disinfectant solutions may discolor the handpiece cable and connector.

SECTION 11: Troubleshooting and Analysis


No vibration No water
Verify handpiece is fully seated on cable plug
Verify handpiece cable is not damaged
Verify handpiece is not damaged
Remove cover from G98A module
Check fuse F1
Fuse OK
YES
NO
Remove module and service
Check Control Unit input voltage
Voltage <21.5VAC or > 28VAC
YES
Service Dental Control Unit
NO
Remove connector J1 from the power board (see fig 5)
Disconnect yellow tubing (between module & 1st tee)
NOTE: Set power control to top of blue zone
Reconnect yellow tubing on tee
NO
Resistance on connector plug > 5 Ohms?
YES
Replace Power cable assembly
Resistance on connector plug > 5 Ohms?
YES
Check whisker valve on handpiece holder
NO
Replace J1 on power board
NOTE: Place handpiece with insert over cuspidor
Verify voltages at J7M-1 (~ +30 VDC) & J7M-3 (~ +15 VDC) Ref J7M-2 (Gnd)
Remove J3M from Oscillator board & connect Ohmmeter to J3M-1 &J3M-2 on connector (Blue & Black wires)
NO
NO voltage or wrong values
YES
Replace Power board
Lightly depress foot controller
Disconnect orange tubing at tee and measure drive air from foot cotroller
NOTE: Lightly depress foot controller
J3M-1 & J3M-2 > 5 Ohms
YES
NO
Remove module and service
Pressure > 15 psi?
YES
Replace control cable assembly
NO
Check Dental Control Unit pilot air


Module activates with handpiece in holder
Remove cover from module and remove connector J1 from power board
Handpiece in holder
Resistance ~0 Ohms?
YES
Check whisker value in holder
Replace power cable assembly
Low or intermittent vibration
Check insert for wear or damage
Insert worn or damaged?
YES
Replace insert
NO
Power control set too low?
YES
Increase power setting
NO
Erratic water spray or flow indicates trapped air in handpiece
Air trapped in handpiece?
YES
Purge air from handpiece
NO
Change handpiece
Vibrations?
Normal
Replace handpiece
Low
Flex handpiece cable with module activated
Vibrations?
Intermittent
Replace handpiece cable assembly
No change
Remove module and service
Water leak in handpiece or cable
Handpiece cable O-Ring missing or damaged
YES
Replace O-Ring
NO
Steri-Mate housing cracked
YES
Replace Steri-Mate handpiece
NO
Replace damaged cable assembly

SECTION 11: Troubleshooting and Analysis, continued



SECTION 11: Troubleshooting Guide

This troubleshooting section is meant for use by qualified Cavitron® Service Technicians.

SYMPTOMS	CAUSES	CORRECTIVE MEASURES
Low insert scaling power or insert stops vibrating when contacting tooth surface.	1. Insert malfunction.	1. Test with another Cavitron® insert. If test insert works properly, discard the original insert.
	2. Insert is not pushed in far enough for automatic pick-up.	2. a. Check if insert is fully seated in the handpiece. b. If a handpiece soft grip is being used, verify that the grip is flush with the hard plastic of the insert port. Refer to the Installation Instructions provided with the soft grip for correct installation.
	3. Unit improperly calibrated.	3. a. Return scaler to DENTSPLY® for factory certified service. b. Refer to DENTSPLY® Professional Division-Product Service SOP PS-00135.
Intermittent scaling power or no scaling power. (continued on next page)	1. Insert malfunction.	1. Test with another Cavitron® insert. If test insert works properly, discard the original insert.
	2. Insert is not pushed in far enough for automatic pick-up.	2. a. Check if insert is fully seated in the handpiece. b. If a handpiece soft grip is being used, verify that the grip is flush with the hard plastic of the insert port. Refer to the Installation Instructions provided with the soft grip for correct installation.
	3. Malfunction in Steri-Mate™ Handpiece.	3. Replace Steri-Mate™ Handpiece.
	4. Bent or missing electrical pin in Steri-Mate™ Handpiece.	4. Replace Steri-Mate™ Handpiece.
	5. Open or intermittent wires in handpiece cable assembly. (continued on next page)	5. Install a working Steri-Mate™ Handpiece on the cable. Unplug the Handpiece cable connector at J3 of the Power Drive PC Board and check the continuity of the wires. a. Connect the ohmmeter between RED-GRN wire terminals. Flex the handpiece cable and check the intermittent readings. If the ohmmeter reading is not consistent or it is indicating an open circuit, the handpiece cable assembly is likely to be damaged and should be replaced. b. Connect the ohmmeter between WHT-GRN wire terminals and repeat the procedure above. (continued on next page)

SECTION 11: Troubleshooting Guide, continued

This troubleshooting section is meant for use by qualified Cavitron® Service Technicians.

SYMPTOMS	CAUSES	CORRECTIVE MEASURES
Intermittent scaling power or no scaling power. (Continued)	6. Loose wiring or defective solder joint in the unit wiring. 7. No power to the unit. 8. Faulty Air Switch.	6. Troubleshoot the unit wiring and connectors. 7. a. Verify 21.6 to 26.4 Volts AC supply to the unit. b. Replace the Power Drive PC board. 8. Replace the component.
Handpiece heats up.	1. Insufficient water to cool handpiece. 2. Air trapped in the handpiece. 3. Insert water passageway clogged. 4. Handpiece cable not supported during procedure. 5. Worn insert being used.	1. Increase the setting on the handpiece lavage control until handpiece runs cool. 2. When the inserts are changed, hold the handpiece in an upright position until the trapped air is removed and the water flows properly. 3. Replace the Cavitron® insert and check operation. 4. Loop handpiece cable around arm or support with finger to prevent water restriction. 5. Replace with a new Cavitron® insert. Worn inserts require higher power settings producing more heat.

SECTION 11: Troubleshooting Guide, continued

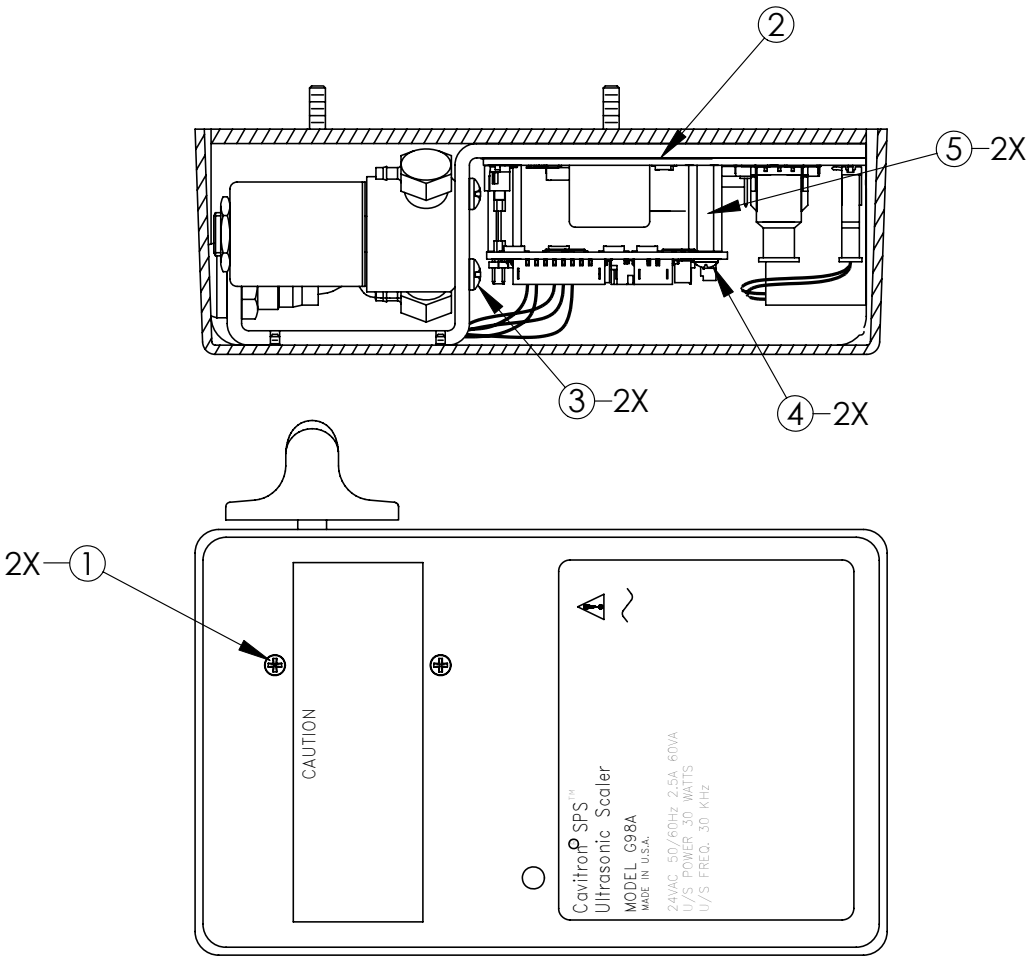
This troubleshooting section is meant for use by qualified Cavitron® Service Technicians.

SYMPTOMS	CAUSES	CORRECTIVE MEASURES
Insert vibrates but no water or insufficient water flows from the handpiece.	1. Low incoming dental office water pressure.	1. Measure water pressure at dental office. Adjust incoming source water pressure to specification. Water pressure should be 25-60 psi.
	2. Improper setting of the water regulator.	2. Adjust the water regulator for 24 psi.
	3. Handpiece cable water tubing and wires twisted.	3. Remove restriction if possible or replace handpiece cable assembly.
	4. Damaged handpiece cable Flow Control.	4. Replace handpiece cable assembly.
	5. Obstruction or mineral deposits in the water system in the unit.	5. a. Remove the insert and turn the water valve full open. Observe the water flow. If the flow is good then the obstruction is in the insert. b. If the obstruction is not in the insert, then remove the handpiece water line at solenoid and check the water flow. If flow is good, then the obstruction is in handpiece supply line.
Water spray from insert is not properly covering the operating area of the activated tip.	1. Improper water flow adjustment.	1. Refer to "Directions for Use for Cavitron® SPS™ Ultrasonic Scaler" for instructions on water flow adjustment.
	2. P-style insert water tube incorrectly aimed.	2. Use small smooth pliers, reposition the water tube and direct the spray at the back of the insert tip.
	3. Insert is partially clogged.	3. Replace the insert.
Water drips from the handpiece when not operating.	1. Water solenoid valve leaking due to trapped debris.	1. Replace the water solenoid assembly.
Water leak from the handpiece while in operation.	1. O-ring worn on insert.	1. Replace the O-ring with genuine Cavitron® O-rings. O-rings are available in packs of 12: Green O-Rings P/N 62605 Black O-Rings P/N 62351
	2. Water leak in plastic water line at handpiece or inside the Steri-Mate™ Handpiece.	2. a. Unplug the Steri-Mate™ handpiece from the cable and replace the small O-ring on the connector. Part No. 79357 (12-Pack) b. Replace the Steri-Mate™ handpiece and/or cable assembly.

SECTION 11: Troubleshooting Guide, continued

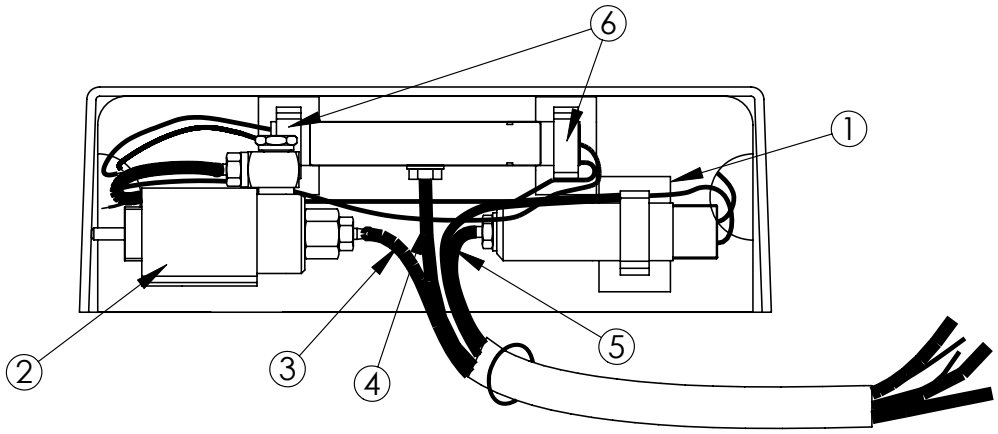
This troubleshooting section is meant for use by qualified Cavitron® Service Technicians.

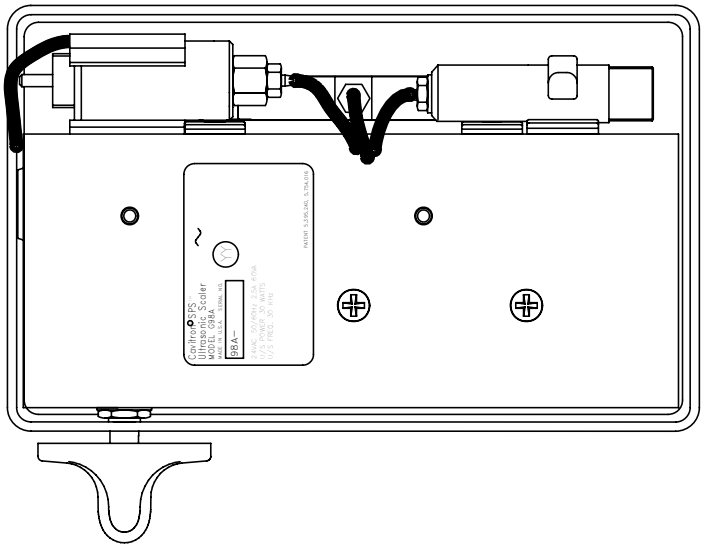
SYMPTOMS	CAUSES	CORRECTIVE MEASURES
Water flow not controllable by turning the handpiece flow control knob.	1. Malfunction of water regulator.	1. Replace the water regulator assembly. Adjust the water regulator to 25 psi.
Inserts cannot be installed in the handpiece properly.	1. O-ring on the insert is dry. 2. Incorrect or damaged O-ring installed on the insert.	1. Lubricate the O-ring with water. If the O-ring is worn, replace it. 2. Replace the insert O-ring with Cavitron® O-rings. O-rings are available in packs of 12: Green O-Rings P/N 62605 Black O-Rings P/N 62351
Boost mode does not function.	1. Verify unit operation. 2. Power set too high. 3. Insert is damaged or worn. 4. Control unit drive air pressure is not varying. 5. Faulty air pressure switch.	1. Fully depress the foot control, slowly reduce pressure until a decrease in spray pattern is observed. 2. Reduce the power setting below the mid-point and verify the operation. 3. Install a new Cavitron 30K insert and verify the operation. 4. Remove the orange tube and verify pressure changes from 0 to 80 psi while depressing the foot control. 5. Replace the component.
Unit activates with the scaler handpiece in the holder.	1. Faulty air switch. 2. Sticking or faulty whisker valve.	1. Remove the yellow tube, if the air present, replace the handpiece holder switch. 2. Repair the control unit.



G98A Cavitron® Scaler Module Assembly

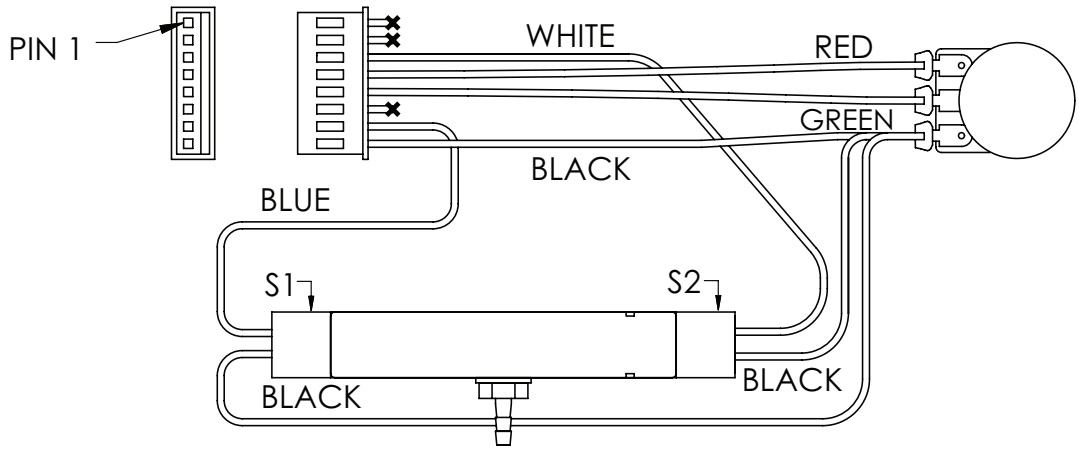
ITEM	QUANTITY	PART NO.	DESCRIPTION
1	2	586037005	SCREW, COVER
2	1	574247007	SIL-PAD, PINK INSULATING
3	2	6297501	SCREW, SOLENOID
4	2	62852	SCREW, PC BOARD MOUNTING
5	2	594002020	STANDOFF, HEX PC BOARD MOUNTING



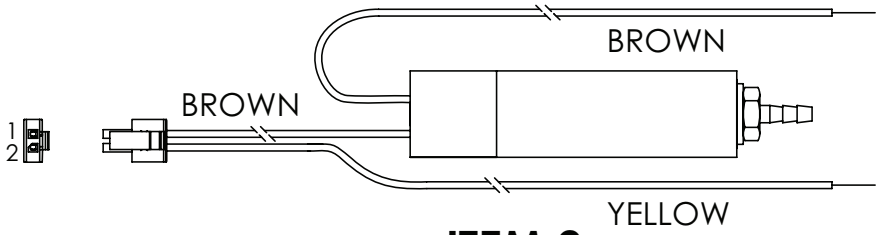


G98A Cavitron® Scaler Module Assembly

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	63770	CLIP, AIR SWITCH (LARGE)
2	1	562096001	CLIP, WATER REGULATOR (GREY)
3	1	61631	TUBING, RED, .062" ID (PER FOOT)
4	1	625036011	TUBING, ORANGE, .062" ID (PER FOOT)
5	1	625036012	TUBING, YELLOW, .062" ID (PER FOOT)
6	2	776030230	CLIP, DUAL AIR SWITCH (SMALL)



ITEM 1



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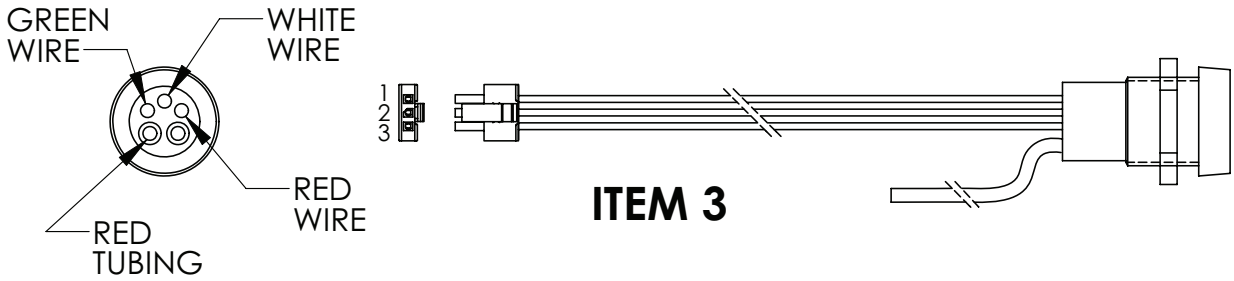
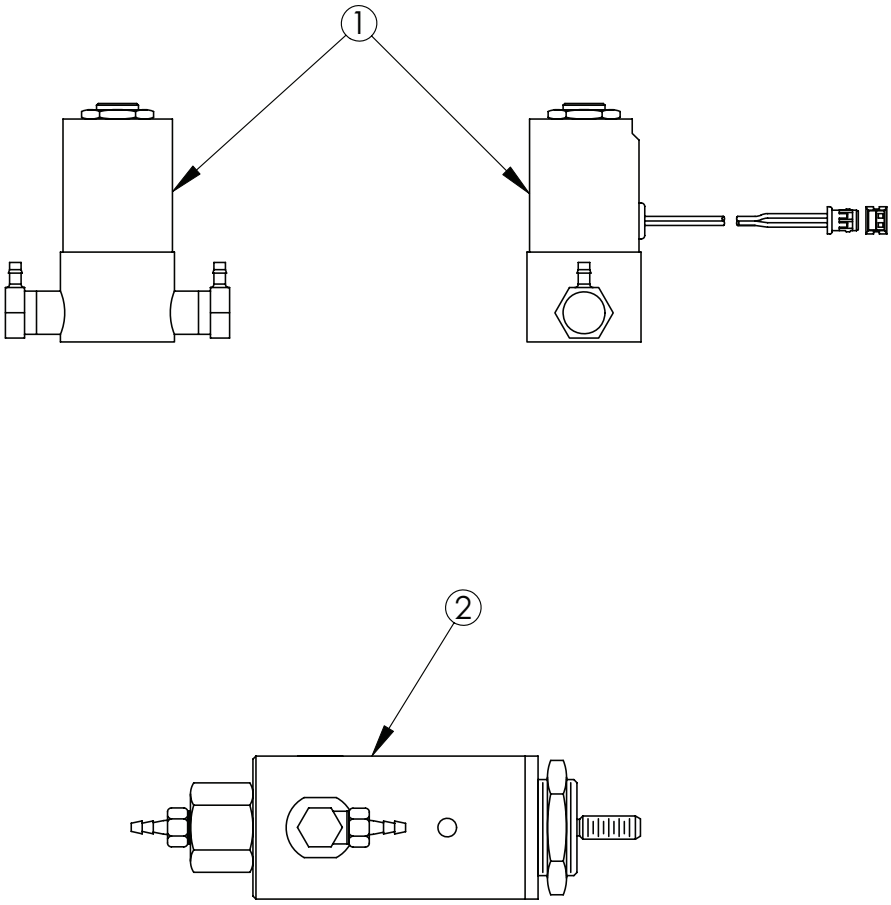


ITEM 3

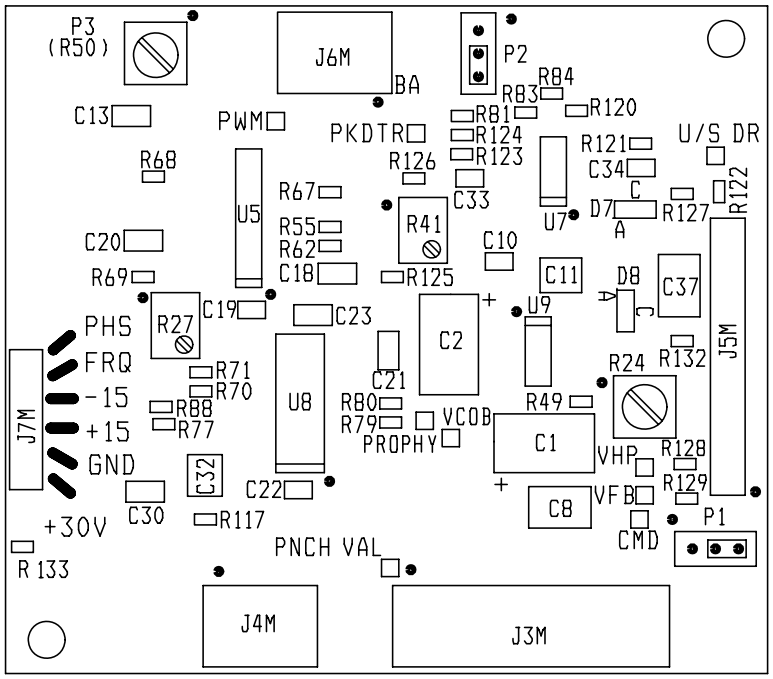
G98A Cavitron® Scaler Harness Assemblies

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	80949	CONTROL CABLE ASSEMBLY
2	1	80950	POWER CABLE ASSEMBLY
3	1	80951	HANDPIECE CABLE HARNESS

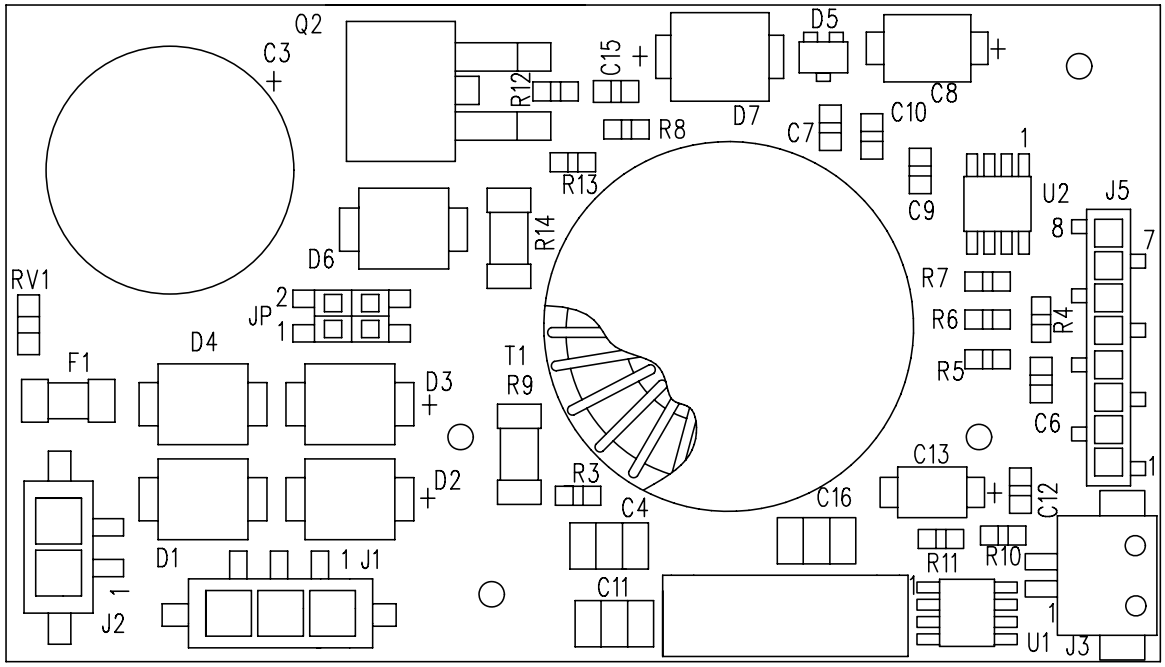


G98A Cavitron® Scaler Water Solenoid and Regulator

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	79924	WATER SOLENOID ASSEMBLY (WITH FITTINGS)
2	1	629195002	WATER REGULATOR ASSEMBLY (WITH FITTINGS)



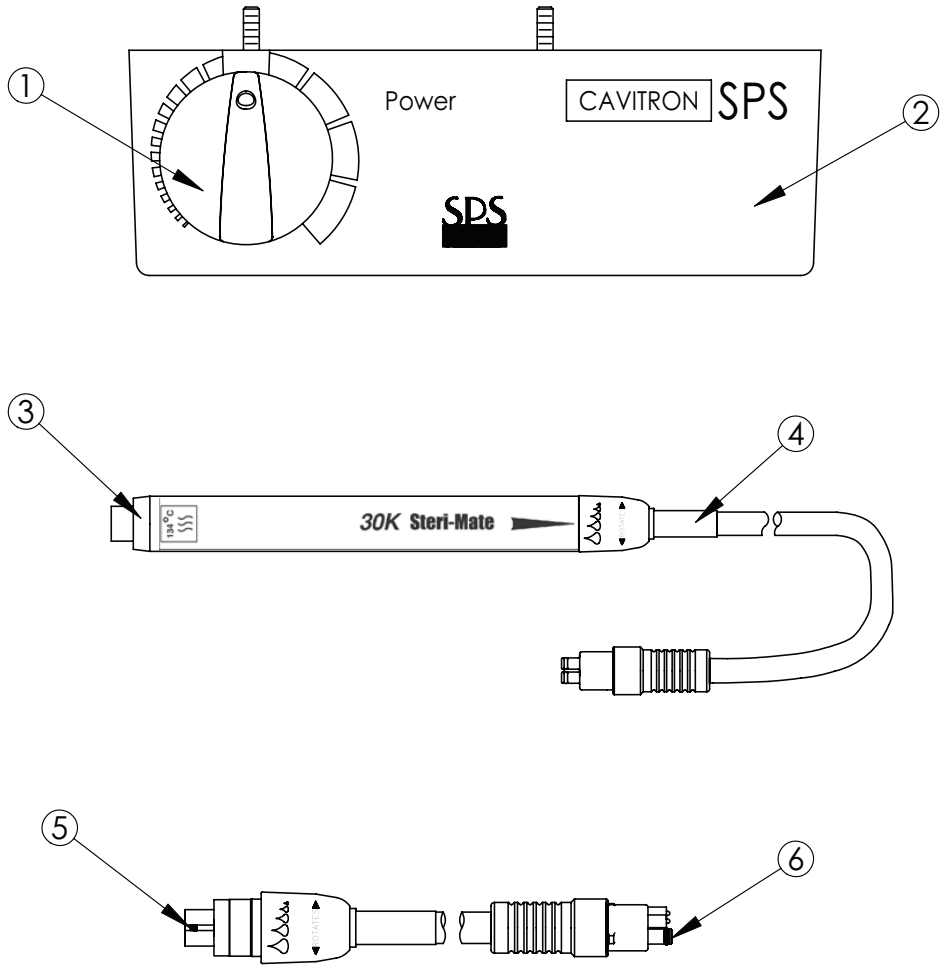
ITEM 1



ITEM 2

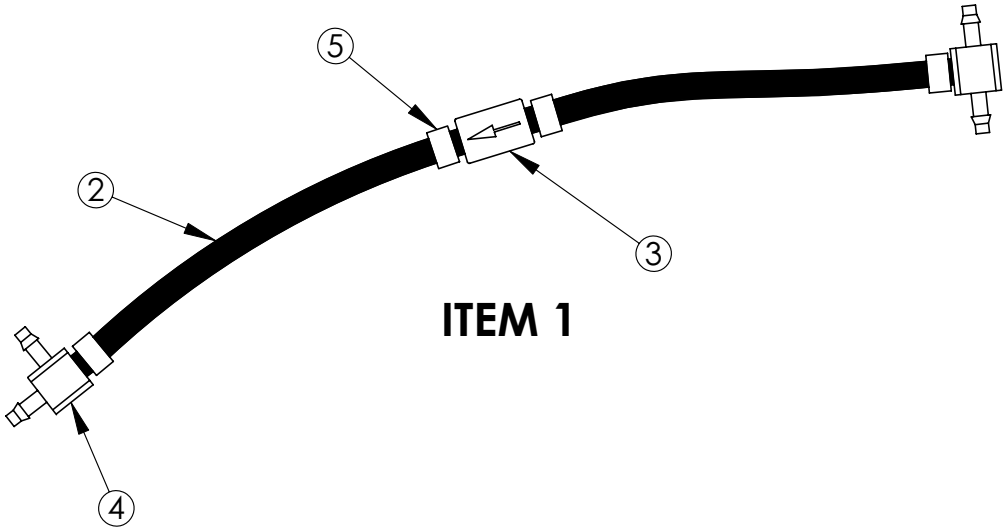
G98A Cavitron® Scaler PC Board Assemblies

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	81020-3	UNIVERSAL SPS CONTROL PC BOARD ASSEMBLY
2	1	81101	POWER DRIVE PC BOARD ASSEMBLY



G98A Cavitron® Scaler Housing and Handpiece Assemblies

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	80502	KNOB, MOLDED BLUE
2	1	80843	COVER, DECORATED
3	1	78688	30K STERI-MATE™ HANDPIECE, DECORATED 1-PACK
	1	78703	30K STERI-MATE™ HANDPIECE, DECORATED 3-PACK
4	1	81279	4-FOOT HANDPIECE CABLE, DECORATED SURF WITH SWIVEL AND FLOW CONTROL
		81277	6.5-FOOT HANDPIECE CABLE, DECORATED BLACK WITH SWIVEL AND FLOW CONTROL
		8127901	11-FOOT HANDPIECE CABLE, DECORATED SURF WITH SWIVEL AND FLOW CONTROL
5	1	79357	O-RING, STERI-MATE™ HP CABLE, 12 PACK
6	1	776030267	O-RING, HANDPIECE PLUG



ITEM 1

G98A Cavitron® Scaler Installation Kit

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	80918	INSTALLATION KIT (W/UNIT MOUNTING HARDWARE)
2	2	625036012	TUBING, YELLOW, .062" ID (PER FOOT)
3	1	623068001	RESTRICTOR ORIFICE, .005"
4	3	623067001	TEE, FITTING, .062" ID
5	12	80777	TUBING CLAMP, .19" ID
	1	623066001	TEE, FITTING, .125" ID
	3	562098001	TUBING CLAMP, .25" ID
	3	587092001	LOCKNUT, NYLON INSERT
	3	588072010	WASHER, FLAT NYLON #6

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Technical Service and Repair Department
1301 Smile Way
York, PA 17404-1785
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Phone: 7531 583 0

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